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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/055,153      | 01/25/2002  | Robert J. Barnett    | 01-49               | 9535             |

7590 08/28/2003

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| EXAMINER |
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WILKINS III, HARRY D

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| ART UNIT | PAPER NUMBER |
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1742

DATE MAILED: 08/28/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/055,153

Applicant(s)

BARNETT ET AL.

Examiner

Harry D Wilkins, III

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-9 and 11-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beck et al (US 5,284,562) in view of Wellwood et al (US 5,718,873).

Beck et al teach the invention substantially as claimed. Beck et al teach (see abstract, figure 6, col. 1, lines 17-60 and col. 11, line 12 to col. 12, line 26) a process for the production of aluminum from alumina dissolved in a molten salt electrolyte contained in a cell free of frozen crust comprising (a) providing a molten salt electrolyte at 660-800°C, (b) providing a plurality of anodes and cathodes disposed in the electrolyte (c) venting volatile material (to the atmosphere) and (d) adding alumina to the cell.

Beck et al do not teach venting the volatile material through a conduit or adding the alumina through the conduit thereby capturing the volatile material on the alumina.

Wellwood et al teach (see abstract, figure 2 and col. 3, lines 42-48) a method of venting a fluoride gas stream from an aluminum smelter through the same conduit as the alumina solid particulate feed thereby facilitating the absorption of the fluoride gas onto the alumina and recycling the fluoride gas with the alumina feed.

Therefore, it would have been obvious to one of ordinary skill in the art to have added the countercurrent gas-solid contacting means of Wellwood et al in the process of Beck et al, thereby venting the volatile material through the same conduit as the alumina feed, because the contacting means of Wellwood et al provide for recycling of the fluoride gases, thus reducing losses in the process.

Regarding claims 2, 3, 11, 12 and 13, Beck et al teach (see abstract and col. 1, lines 29-31) that the electrolyte is  $\text{AlF}_3$  plus a combination of NaF, KF and LiF.

Regarding claims 4 and 16, Beck et al teach (see col. 1, lines 54-56) maintaining the bath at 660-800°C.

Regarding claims 5 and 17, Beck et al teach (see paragraph spanning cols. 8 and 9) that the current density was 0.5 A/cm<sup>2</sup>.

Regarding claims 6 and 18, Beck et al teach (see abstract) that the anodes were made from a Ni-Cu-Fe alloy.

Regarding claims 7 and 19, Beck et al teach (see col. 4, lines 17-21) that the cathodes were made from  $\text{TiB}_2$ .

Regarding claims 8 and 20, Beck et al teach (see figure 6) arranging the anodes and cathodes vertically in alternating relationship.

Regarding claim 9, Beck et al teach (see col. 1, lines 36-40) that the alumina particles are added during the electrolysis and that the particles are maintained in suspension. This means that the alumina in the electrolyte is saturated, otherwise, the particles would dissolve in the electrolyte.

Regarding claim 11, Beck et al teach (see abstract) using  $\text{AlF}_3$  with NaF.

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Regarding claim 14, Beck et al teach (see col. 11, lines 25-29) that  $\text{AlF}_3$  is present at 44 mol% and NaF at 56 mol%. This converts to 61.11 wt%  $\text{AlF}_3$ .

Regarding claim 15, Beck et al teach (see col. 1) (c) passing an electrical current from the anodes, through the electrolyte and into the cathodes, which deposits aluminum on the cathode.

3. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Beck et al in view of Wellwood et al as applied to claims 1-9 and 11-20 above, and further in view of Duruz et al (US 4,397,729).

The teachings of Beck et al in view of Wellwood et al are described above in paragraph no. 2.

Beck et al in view of Wellwood et al do not teach that the anodes were made of a cermet material.

Duruz et al teach (see abstract and paragraph spanning cols. 1 and 2) that a cermet material anode was used and it was substantially resistant to attack by cryolite-alumina melts.

Therefore, it would have been obvious to one of ordinary skill in the art to have adapted the cermet anodes of Duruz et al for use in the process of Beck et al because the cermet anodes were highly resistant to corrosion in the molten electrolyte.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Harry D Wilkins, III whose telephone number is 703-305-9927. The examiner can normally be reached on M-Th 10:00am-8:30pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy V King can be reached on 703-308-1146. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Harry D Wilkins, III  
Examiner  
Art Unit 1742

hdw

ROY KING  
SUPERVISORY PATENT EXAMINER  
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